

PROB. 11.2

$$X = 12t^3 - 18t^2 + 2t + 5 \quad (X \text{ in m, } t \text{ in s})$$

FIND X AND V WHEN $a = 0$

$$V = \frac{dx}{dt} = 12(3t^2) - 18(2t) + 2 = 36t^2 - 36t + 2$$

$$a = \frac{dv}{dt} = 36(2t) - 36 = 72t - 36$$

$$\text{LET } a = 0 = 72t - 36 \Rightarrow t = \frac{1}{2} \text{ s}$$

$$X = 12\left(\frac{1}{2}\right)^3 - 18\left(\frac{1}{2}\right)^2 + 2\left(\frac{1}{2}\right) + 5 = \boxed{3 \text{ m}}$$

$$V = 36\left(\frac{1}{2}\right)^2 - 36\left(\frac{1}{2}\right) + 2 = \boxed{-7 \frac{\text{m}}{\text{s}}}$$